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ARTICLE

Reading for meaning: the effects of Developmental Education on reading achievements of primary school students from low SES and ethnic minority families

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ABSTRACT

The appropriateness of innovative educational concepts for students from a low socioeconomic status (SES) or ethnic minority background is sometimes called into question. Disadvantaged students are supposed to benefit more from traditional approaches with Programmatic Instruction (PI). We examined Developmental Education (DE), an innovative approach, inspired by Vygotskian theory, in which reading skills are developed through meaningful reading of texts corresponding to students' self-generated problems. The effectiveness of DE is compared to PI in terms of reading comprehension, strategy knowledge, and reading motivation of 4th-grade students; 170 students from ethnic minority or low SES background participated in a pretest-posttest natural 2-group design. Outcomes were similar in both approaches, with one exception: Students with an ethnic minority background in DE performed better on strategy knowledge than similar students in PI. These results are discussed in relation to previous studies on the appropriateness of innovative curricula for disadvantaged students.

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Introduction

In the educational field, the appropriateness of using innovative educational concepts for students with a disadvantaged educational position is sometimes called into question. Hornstra, Mansfield, Van der Veen, Peetsma, and Volman (2015), for example, found that teachers in primary education believed that controlling teaching practices were more suitable and beneficial to "at-risk" students than innovative, autonomy-supportive practices. By using a traditional, controlling teaching style, teachers felt they were adapting to the needs and preferences of their disadvantaged student population. Few studies, however, have actually investigated the effects of innovative educational practices on the achievements of students with different backgrounds. Salinas and Garr

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(2009) examined the effect of "learner-centered" education on the academic achievements of minority and non-minority third to sixth grade students. Whereas the scores of minority students were lower at traditional schools, they scored as high as non-minority students in learner-centered schools. Hornstra, Van der Veen, Peetsma, and Volman (2015b) studied the relation between the extent of innovative learning in classrooms (according to teachers themselves) and student achievements in a population that varied in socioeconomic status (SES) and ethnic minority backgrounds. Innovative learning was defined as collaborative learning, authentic learning, and a focus on self-regulation. No significant relations between innovative learning and reading comprehension were found for any of the student groups.

In this study, we focus on an innovative approach, known as Developmental Education, and its effect on reading in primary school. Developmental Education (DE) is an innovative approach, inspired by Vygotskian learning theory, that is practiced in about 5% of primary schools in The Netherlands. Teachers create meaningful thematic units in which all activities relate to the theme. Reading is embedded in an "inquiry curriculum"; students select and read informative texts, and the selection of texts is driven by students' research questions. Teachers seek to involve all students in reading texts that correspond to their self-generated problems, interests, and reading levels. In a previous study (Van Rijk, De Mey, De Haan, Van Oers, & Volman, 2017), it was found that reading results of students from DE schools were equal to those of students from schools with traditional reading programs. The aim of this study is to get a better understanding of the effects of DE on students from ethnic minority groups and students with low-educated parents. For this purpose, we compare school achievements of students from these groups in DE schools and in more traditional schools. Since reading is a key subject matter in the curriculum, the focus is on the development of three components of reading: reading competence, knowledge of reading strategies, and reading motivation.

Theoretical background

The educational position of students from ethnic minority groups and students with low-educated parents

There is an overwhelming body of research into the educational position of two categories of students that are often considered as disadvantaged, that is, students from ethnic minorities/second-language learners and students from lower socioeconomic milieus. Large-scale and review studies have been carried out pertaining to, among others, the European (Nusche, 2009; Organisation for Economic Co-operation and Development, 2012), the US (Perie, Grigg, & Donahue, 2005), and the Dutch situation. In The Netherlands, ethnic minority and low SES students on average lag behind 1 up to 2.5 years in reading comprehension at the end of Grade 6 (Driessen, 2013; Gijsberts, 2003) and have the lowest scores on the final test in primary and secondary education (Mulder et al., 2014).

However, the category of ethnic minority students includes a large variety of backgrounds. The Turkish, Moroccan, Antillean, and Surinamese are the four largest groups of migrants in The Netherlands. Moroccans and Turks came as labor migrants, whereas

Surinam and the Netherlands Antilles are former colonies of The Netherlands. Labor migrants from Eastern European countries are a relatively new minority group. There is also a large number of minorities from Western countries (Germany, US, UK, France) who are relatively high educated. It should be noted that the educational position of their children cannot be qualified as disadvantaged.

Effectiveness of educational approaches

Studies into the effectiveness of innovative educational approaches are rare, in particular for these groups of students. The bulk of educational and reading research involves the search for factors that are effective in teaching and learning in general. The meta-meta-analysis of Hattie (2009) of "what works" in teaching, for example, does not differentiate for different groups of students. The top factors in effective teaching, such as the quality of teaching, providing feedback, and good teacher–student relationships occur in both traditional and innovative approaches. Moreover, Hattie's educational factors are not studied in conjunction (Driessen, 2013) and leave aside educational content, that is, "the pedagogical significance of subjects, reflections about problems, and possibilities of legitimizing curricular decisions", despite his emphasis on content-oriented learning (Terhart, 2011, p. 431). These educational factors thus provide insufficient indications to judge innovative educational approaches based on specific theoretical views such as Developmental Education in The Netherlands.

The meta-analysis of the RAND reading study group (Snow, 2002) showed that there is a fairly detailed knowledge base on effective instructional practices for reading. Innovative approaches such as the embedding of strategy instruction in the context of subject-matter learning, considerate provision of meaningful choices, autonomy and responsibility of students, and collaborative learning structures are positively evaluated in general (Snow, 2002). As yet, there is little evidence, however, on how teachers should combine and prioritize instructional practices for low achievers in high-poverty schools and for students who are second-language learners of the language in these schools (Snow, 2002).

The relationship between family and school: parenting styles and teaching practices

The reason for skepticism about innovative educational practices for students from disadvantaged backgrounds mentioned in the introduction lies in the assumed misfit between students' home environment and such educational practices. In contrast to traditional learning environments in which the teacher directs the learning process and is oriented towards transmission of knowledge, innovative approaches demand a more active role of students in their own learning process giving more room to their initiatives, choice, responsibility, and collaborative participation, and challenge students' curiosity (Huber, 2003; Van Hout-Wolters, Simons, & Volet, 2000; Wells & Claxton, 2002). Students from high-educated ethnic majority families are expected to benefit from such innovative educational environments, as this would fit the parenting style they are used to. Disadvantaged students are supposed to benefit more from traditional approaches in which a fixed curriculum, direct instruction, and rehearsal are core, as this

would fit the more authoritarian socialization in their homes (De Kock, Sleegers, & Voeten, 2004; Heemskerk, Brink, Volman, & Ten Dam, 2005; Overmaat & Ledoux, 2002; Pels, Nijsten, Oosterwegel, & Vollebergh, 2006). Low-educated parents and parents from ethnic minority backgrounds indeed report more authoritarian and directive parenting behaviors oriented towards conformity rather than individual autonomy; this in comparison to high-educated majority parents who report a more authoritative parenting style encouraging children's initiative and responsibility (Hermans, 1995; Pels & Nijsten, 2006; Pels et al., 2006). There is little empirical research on the moderating role of parenting styles in educational achievements; the limited research indicates that authoritative styles may facilitate achievement, but that this is not consistently the case across socioeconomic milieus and ethnicity (Spera, 2005).

The relationship between type of education and achievement

Recently, some studies have investigated the fit between types of education of disadvantaged students and their achievements. Salinas and Garr (2009), Hornstra et al. (2015b), and Van Oers and Duijkers (2013) investigated the relation between innovative educational practices and achievement of students with a disadvantaged position in school. Salinas and Garr examined the effect of "learner-centered" education on the academic achievements of minority and non-minority third to sixth grade students. Learner-centered education involved, among others, a constructive nature of the learning process, an orientation towards motivational and affective processes, a social climate that facilitates meaningful learning, and attention for individual differences. Schools were selected on the basis of self-description in US nationwide databases. Two sets of measures for achievement were used: standard academic achievement measures for language, math, and subject matter and non-traditional measures for assessing 21st-century skills like initiative, creativity, active learning strategy, receptiveness to diversity, and ability to collaborate. Differences were found between minority and non-minority groups in academic achievements in the traditional schools, with lower scores for minority students, but not in the learner-centered schools. Students of the learner-centered approach scored higher on most of the non-traditional measures, regardless of ethnicity.

Participants in the Hornstra et al. (2015b) study were fifth and sixth grade primary school students, varying in SES and ethnic minority/majority backgrounds. The focus was on the relation between teachers' perceptions of their innovative practices relating to three components, authenticity of the learning environment, collaborative learning, and focus on self-regulation, on the one hand, and the reading and math achievements measured by tests of the Dutch National Institute for Educational Measurement (Cito), on the other hand. No significant relations were found between (teachers' perceptions of) the extent of innovativeness of their teaching practices and reading comprehension scores of the two groups of students, but for math the picture was mixed. Nevertheless, teachers of schools with many students from ethnic minority and low SES families perceive innovative autonomy-supportive teaching styles as less suitable than traditional, more directive and controlling methods (Hornstra, Van der Veen, Peetsma, & Volman, 2015a). Teachers from schools with many children from these groups reported that they used more directive teaching irrespective of their personal preference for

autonomy-supportive styles. Students' perceptions and preferences of teaching styles were contingent upon the teaching styles of their teachers in these schools. In the same vein, school directors found a more constructivist teaching model for the characteristics and needs of disadvantaged children only appropriate in a limited way (Overmaat & Ledoux, 2002, p. 365). Tesser and Iedema (2001) suggest that "effective education for students with disadvantaged backgrounds asks for a well-structured, teacher-centered, whole-class approach in which priority is given to key subjects (such as reading and math) and the teacher is working towards clearly defined standards of performance" (p. 103) (by which is meant outcomes on standardized tests).

Van Oers and Duijkers (2013) studied vocabulary acquisition of students in Grades 1 to 4 of primary school, varying in SES and ethnic minority/majority backgrounds. They compared two classroom conditions, a teacher-driven task-based program and a Developmental Education learning environment, in which students learn new vocabulary by taking part in meaningful joint activities. Students from different SES and backgrounds in DE had better outcomes than students in the programmatic condition.

For theoretical as well as for policy reasons, the results of these studies make it interesting to investigate the achievements of students from low SES and ethnic minority families in schools for Developmental Education as an innovative approach, compared to schools with a more traditional approach. Before presenting the study, we briefly explain how this approach differs from traditional instruction. For a more elaborate discussion of DE, the reader is referred to Van Rijk, Volman, De Haan, and Van Oers (2017) and Van Oers (2009).

Reading instruction in the programmatic approach and in Developmental Education

The regular, traditional approach of reading instruction in the vast majority of Dutch schools is a textbook-driven programmatic instruction approach, in which strategy instruction is a central issue, in addition to exercises for vocabulary and textual skills such as pronominal procedures. The reading curriculum is delivered through a grade-leveled series of textbooks published by an educational publisher. Schools are free to choose any of the publishers. In accordance with research findings, modern reading programs teach a limited set of multiple strategies (Davis, 2010; National Institute of Child Health and Human Development, 2000; Snow, 2002).

Whereas in programmatic instruction the learning process is programmed in a detailed manner with strict adherence to textbooks and with emphasis on strategy instruction, in Developmental Education the focus is on meaningful content; strategy instruction is provided when needed for understanding of the content of the text.

The theoretical basis of Developmental Education (DE) is the cultural historical activity theory (CHAT) originating in the work of Vygotsky (Wells & Claxton, 2002). The basic assumption of this theory is that learning is fundamentally shaped by social interaction. Central concepts are "mediation" and "psychological tools", referring to the role of human and symbolic intermediaries in the transformation of the cultural world by the learner, to make sense of this world. In CHAT, culture is a dynamic notion, referring to values, experiences, artefacts, and conventional patterns of social interactions "indexed in our everyday practices" (Pacheco & Gutiérrez, 2009). Learning is embedded in these

practices. The aim of teachers in educational approaches inspired by CHAT, such as Developmental Education, is to design authentic and meaningful learning experiences that relate to and build upon students' funds of knowledge acquired in their environments (Moll, Amanti, Neff, & Gonzalez, 1992; Wardekker, 2012; Wells, 2000). Meaningful activities are central in the curriculum in order to engage students in learning. The main purpose is for students to learn to make sense of the world they live in, in such a way that they acquire agency, that is, learn to create meaning themselves by becoming participants in the classroom as a community of learners. The ultimate goal is to strengthen students' agency.

In the approach to literacy in Developmental Education (DE), reading (and writing) is primarily seen as an activity aimed at interpreting the world. In the teaching of reading, the search for meaning is the starting point. This is in line with the view of the RAND reading study group, which states that "the main purposes for reading are gaining meaning and gaining knowledge" (Snow, 2002, p. 40). Reading comprehension instruction is defined as giving "students access to culturally important domains of knowledge and provides a means of pursuing affective and intellectual goals" (Snow, 2002, p. 29). In particular, the Concept Oriented Reading Instruction (CORI) of Guthrie and colleagues (Guthrie, McRae, & Klauda, 2007; Guthrie & Wigfield, 2000) has been a source of inspiration for the DE reading program. In the CORI approach of reading, engagement is core. These engagement processes are assumed to mediate the effect of instructional classroom practices on reading comprehension to a large extent. Reading engagement is defined as "interacting with text in ways that are both strategic and motivated" (Guthrie, Wigfield, & You, 2012, p. 602). The view is that, if reading practices in the classroom provide students with content that is meaningful to them and relevant to their lives, they will be motivated to read. This motivation, conceived as student's goals, values, and beliefs with regard to the reading activity, is thought to energize and direct cognitive-behavioral engagement processes such as the use of strategies involved in reading. The effortful and deliberate processes of strategic behavior in their turn lead to understanding a text and, ultimately, to reading competence.

Although the engagement perspective of Guthrie and Wigfield (2000) is related to the DE approach, reading in DE has a broader range than the focus on integrating reading in the teaching of subject matter in CORI (Van Rijk, Volman, et al., 2017). In the DE curriculum, inquiry is the core activity in the higher grades (cf. Wells, 2000). Teachers create meaningful thematic units in which all activities relate to the theme. The selection of informative texts is driven by students' self-generated research questions. Teachers seek to engage all students in reading texts that correspond to their interests and reading levels. Students are encouraged to bring relevant texts from home into the classroom and to share their ideas and thoughts. Students perform inquiries in collaborative expert groups and visualize their questions in "wall posters". They may interview experts in their own environments or invite them to the classroom, or may set up an experiment to find answers. Strategy instruction and teaching of vocabulary and textual skills are an integrated part of the activities, as they pertain to understanding the content of what is read. Whole classroom instruction is alternated with flexible instruction adjusted to the needs of individual students or expert groups. Oral interaction and writing are inseparably connected to reading. Students write down answers to their questions to give each other information. Classroom discussions are occasions for

collaborative thinking about problems and the student's answers, inspiring students to revise their texts. Together with other products from the thematic unit, the revised texts are prepared for presentation, often to an audience of parents and students from other groups (Van Rijk, Volman, et al., 2017).

The present study

Innovative approaches are considered suitable and profitable for students who belong to the ethnic majority, and who have parents with relatively high educational levels. The aim of DE teachers and DE schools, however, is that their students will all benefit from the innovative DE approach, including students with disadvantaged backgrounds. In a former study (Van Rijk, De Mey, et al., 2017), reading results of students in DE schools appeared to be equal to those of students in schools with traditional reading programs.

In the present study, we exclusively focus on students with a minority background and/or low-educated parents. It is examined to what extent such a background affects reading comprehension, knowledge of reading strategies, and reading motivation of fourth-grade students in Developmental Education (DE) compared with the traditional approach, which we refer to as Programmatic Instruction (PI). The focus is on the reading of informative texts. We focus on Grade 4 students as participants, as schools generally begin teaching students to read informative texts in this grade (age 9 or 10).

The research questions are as follows:

(1) To what extent do students from ethnic minorities in Grade 4 in innovative DE schools differ from similar students in traditional PI schools with regard to reading comprehension (RC), reading strategies (RS), and reading motivation (RM)?
(2) To what extent do students from low SES families in Grade 4 in innovative DE schools differ from similar students in traditional PI schools with regard to RC, RS, and RM?

Methods

Design

This study employed a pretest-posttest natural two-group design. An innovative approach, Developmental Education (DE) was compared to a more traditional approach, Programmatic Instruction (PI), the latter being default in The Netherlands. For these two approaches, we were aiming to find out how students' reading comprehension, knowledge of reading strategies, and reading motivation would evolve in the course of a school year for two groups of students with a risk of educational disadvantage, that is, students with an ethnic minority background and students from families with a low parental education level. Control variables were reading vocabulary, non-verbal IQ, and gender.

The pretests were administered in the beginning of the school year (September and October), while the posttests were conducted at the end (May and June). At both points in time, tests of reading comprehension and reading vocabulary were administered to the students, with students moreover completing questionnaires about reading motivation and knowledge of reading strategies. However, non-verbal IQ tests were

administered only at the pretest. Both during the pretest and the posttest, no more than two or three test sessions per day were scheduled to minimize test fatigue.

Participants

From 24 classes in 24 schools (1 class per school), 170 fourth-grade students (aged 9 to 10) from ethnic minorities or with low parental education were selected; 143 students were from an ethnic minority background, and 74 students from low SES families. These are different but partly overlapping categories; 47 students were from both ethnic minority and low SES families. The DE group (n = 84 students) consisted of students from 12 classes. Five classes combined students from the third and fourth grades, but only fourth graders participated in this study. The PI group (n = 86 students) consisted of students from 12 fourth-grade classes. Schools and teachers voluntarily participated in this study, and informed consent was obtained from the students' parents.

Seventy-four students from ethnic minorities were in a DE school versus 69 students in a PI school. Of the students with a low parental education level, 34 students were in a DE school versus 40 students in a PI school. Seventy-nine students were boys, 91 students were girls. Table 1 shows the number of minority and low SES students in DE and PI. For an overview of some background characteristics of the participants, see Table 2. Procedures of school selection had taken place for a previous study (see Van Rijk, De Mey, et al., 2017).

Variables and instruments

Data regarding the background characteristics of the students were collected from the school administrations and included student *gender, SES* (parental education level), and *ethnic minority/majority* (parental country of origin and home language).

To determine ethnic minority/majority, we also asked students to provide the country of origin of their parents because the schools used different systems for the registration of parental country of origin. Since the extent to which the language spoken at home may be a predictor of reading comprehension, we also asked them about the language(s) spoken predominantly at home (Dutch, another language, or a mix of both). The data regarding country of origin and home language provided by the students were combined into one dichotomous variable, ethnic minority/majority. The majority category was native Dutch, that is, both parents are native Dutch, and Dutch is the home language; in the minority category, one or both parents are not native Dutch and Dutch is not or not the only language spoken at home.

SES represents parental education level. In The Netherlands, students are selected into one of four different tracks at the age of 12 (after primary education): prevocational

Table 1. Number of minority and low SES students per approach (DE and PI).

approach	minority high SES	minority low SES	Dutch low SES	subtotal minority	subtotal low SES	sum total
DE	50	24	10	74	34	84
PI	46	23	17	69	40	86
	96	47	27	143	74	170

Table 2. Overview of some background characteristics of ethnic minority students by approach (DE and PI).

		DE				PI			
		high SES		low SES		high SES		low SES	
		n = 50 (100%)		*n* = 24 (100%)		*n* = 46 (100%)		*n* = 23 (100%)	
		n		*n*		*n*		*n*	
home language	other than Dutch	8	(25%)	6	(25%)	2	(4%)	4	(17%)
	mix of other language and Dutch	42	(75%)	18	(75%)	44	(96%)	19	(83%)
country of origin mother	Morocco/Turkey	15		11		14		8	
	Surinam	4		1		8		1	
	Antilles					2			
	not Western	12		9		10		10	
	Western	11		3		5		2	
country of origin father	Morocco/Turkey	9		9		9		5	
	Surinam	2		1		8		1	
	Antilles	1				1			
	not Western	21		11		12		10	
	Western	19		3		8		5	

secondary education – vocational track (4 years), prevocational secondary education – theoretical track (4 years), general secondary education (5 years), or pre-university education (6 years). Prevocational secondary education gives access to senior secondary vocational education; general education gives access to professional higher education; the pre-university track to university. Information on parental educational level was retrieved from the school administration for both parents separately. We used the following categories: only primary education, prevocational secondary education (vocational or theoretical track), senior secondary vocational education, and higher education. We combined the educational level of both parents into two categories. Low SES: One of the parents has only finished primary education, or both parents have maximal prevocational education, vocational track. High SES: At least one parent has finished the theoretical track of prevocational secondary education or a higher form of secondary education. These categories correspond with the weight factors the Dutch government uses for school funding to compensate for disadvantaged students.

All tests used in this study were national or international standardized tests for which the validities and reliabilities have been established in previous research.

Reading motivation was measured with a questionnaire that consists of 46 items, spread over seven subscales that have been validated and tested in previous research (De Milliano, 2013; Guthrie, 2010; Tellegen & Frankhuisen, 2002; Wigfield & Guthrie, 1997). Students were asked to indicate the extent to which each item applied to them on a 5-point scale (1 = *does not suit me at all*; 5 = *suits me very well*), or a 3-point scale (1 = *always*, 2 = *sometimes*, 3 = *never*), depending on the origin of the scale. Table 3 shows the subscales used.

The curiosity, preference for challenge, and extrinsic motivation subscales originated from the Motivation for Reading Questionnaire (MRQ; Guthrie, 2010). We used the translation for the Dutch context (Förrer & Van de Mortel, 2010). The other subscales have been developed and tested by Dutch researchers: intrinsic value, utility value, and self-efficacy by De Milliano (2013), and instrumental motivation by Tellegen and Frankhuisen (2002).

Table 3. Subscales of the reading motivation questionnaire.

subscale	No. of items	measures the extent to which students	example
curiosity	7	read out of curiosity or interest for certain subjects.	There are different subjects that I like to read about.
preference for challenge	4	are ready to make an effort to understand a difficult text.	I like to read a rather difficult book.
extrinsic motivation	6	read because they have to, or because they will be rewarded.	I am going to read because I will get a high grade at school.
intrinsic value	10	read informative texts because they like to read them for reading itself.	I like to read for subject matters like History and Geography.
utility value	6	read because they find it useful.	In your spare time it is useful when you are good at reading.
self-efficacy	6	are confident about their ability to understand a text.	I am good at reading.
instrumental motivation	7	read as a means to gain knowledge, to reach a goal.	If I want to know something about my hobby, I read about it.

For the present sample, reliability was calculated using Cronbach's α. Reliability of the subscales from the MQR was poor for preference for challenge (.58) and utility value (.65). These subscales were not retained in further analyses. For the five subscales retained, the mean sum scores were used, which ranged from 0 to 19. Reliability was estimated using Cronbach's α, which was between .68 and .80. This is acceptable (Field, 2009; Sijtsma, 2009).

Reading comprehension was assessed using the 2006 Progress in International Reading Literacy Study (PIRLS) for students aged 9 and 10 in 40 countries (Mullis, Martin, Kennedy, & Foy, 2007). We used the test part consisting of a booklet with informative texts (three texts about *Searching for food*). Students answered 15 questions, of which 8 were multiple-choice and 7 open-ended questions. For three open-ended questions, a score of two points could be obtained, making the overall maximum score 18. The questions assessed the following four categories: (1) the ability to focus on and retrieve explicitly stated information; (2) the creation of straightforward inferences; (3) the interpretation and integration of ideas and information; and (4) the examination and evaluation of content, language, and textual elements. An open-ended question was, for example: "What is similar in the way ants and pill bugs find their food?" The open-ended questions were scored by two fellow researchers, using the PIRLS scoring guide. Answers were discussed to obtain consensus. For the present sample, Cronbach's α was used to calculate reliability of the sum scores, and was .73. Reliability, therefore, is moderate, but acceptable.

Knowledge of reading strategies was assessed via a questionnaire that was developed by Brand-Gruwel (1995). This questionnaire consisted of 22 multiple-choice questions regarding strategies that are to be applied before, during, and after reading, such as goal setting and predicting, question answering, and summarizing. Questions were of the type "What is best to do … (e.g., before reading)?" Students had to choose the best option out of three: the most adequate strategy, a less adequate strategy, and an irrelevant strategy. The sum score ranged from 0 to 44. For the present sample, Cronbach's α was .68, which means that reliability is moderate, but acceptable.

Reading vocabulary was measured using a standardized test (Verhoeven & Vermeer, 1995). This test consists of 30 multiple-choice items. From among four possible answers, students were required to choose the meaning of the word that was underlined in a

sentence. The sum score ranged from 0 to 30. For the present sample, reliability was good (Cronbach's α was .84).

Non-verbal IQ was measured using the Raven Standard Progressive Matrices (SPM) (Raven, Raven, & Court, 2000). This test measures students' reasoning abilities and consists of 60 items that are listed by order of difficulty. Each item presents a set of geometrical figures of which one figure was missing. The missing item must be selected from a set of six or eight answers. The test was administered to the entire group. The sum score ranged from 0 to 60. For the present sample Cronbach's α was .79, which means that reliability was moderate, but acceptable.

In order to verify whether reading instruction was provided as intended in DE and PI, a *teacher questionnaire* was used. The questionnaire consisted of 26 statements on a 5-point Likert scale. The maximum sum score was 130. The statements were divided into six categories. The first category was about the programmatic or non-programmatic character of the approach (e.g., "I use a pre-programmed textbook for reading comprehension"). This was followed by five sets of statements, each covering one of the motivational components that were distinguished by Guthrie et al. (2004) and have been incorporated into DE – integration of reading instruction in subject matter, providing interesting texts, choice of text, collaboration, fostering successful reading experiences by providing appropriate texts, and positive feedback (self-efficacy). Items were, for example, "In my class students use information from texts read for other learning activities" or "In my class students may choose informative texts to read".

Additionally, during data collection, a researcher was present five or six times in every classroom. Informal observation of the classrooms and informal conversation with the teachers offered an opportunity to verify features of the reading approaches: the types of text used (textbooks for PI, and no extra texts visible in PI classrooms versus a variety of meaningful texts for DE), the classroom context, such as the way in which teachers provided reading instruction (teacher manuals for PI, flexible instruction adjusted to students' level from teachers for DE), visibility of research questions (wall posters), and collaboration in DE classrooms.

Data analysis

In the present study, analyses were performed for ethnic minority students (n = 143) and low SES students (n = 74) separately (with an overlap regarding 46 students that were from both ethnic minority and low SES families). The student data had a two-level hierarchical structure; that is, students (Level 1) were nested within classrooms (Level 2, N = 24). As only one class per school participated, the classroom level was equal to the school level. The assumption of the independence of the observations was tested. We deduced from the intra-class correlations (ICC's) that multilevel modeling was the most suitable approach for data analysis. Intra-class correlations ranged from 8% to 24%. We used the mixed-model procedures of SPSS (20.0) with maximum likelihood (ML) estimation[1] (Hox, 1995).

Inspection of the missing values revealed that, for some covariates, the missing data points were substantial (> 5%). Therefore, multiple imputation was applied, as this technique is favorable for parameter estimation (Tabachnick & Fidell, 2001). In addition to the

original dataset, five imputed sets were created, using the multiple imputation procedure in SPSS 20. The outcomes of the "pooled" imputed set were used in subsequent analyses.

As we were interested in effects of the educational DE and PI approaches on the outcome variables of reading comprehension, knowledge of reading strategies, and reading motivation for minority students (Research question 1) and low SES students (Research question 2), effects on these variables were analyzed for both categories of students (minority and low SES) using a step-up model building strategy (West, Welch, & Galecki, 2007). Standardized scores (*z* scores) were used for analyses and, following Tymms (2004), we calculated effect sizes for dichotomous and continuous variables, using Cohen's *d* as a standardized measure for hierarchical linear modeling. According to Cohen's guidelines (1988), $d = 0.2$ represents a small effect size, $d = 0.5$ represents a medium effect size, and $d = 0.8$ represents a large effect size. For testing the results, a 95% confidence level was used.

All analyses begin with intercept-only (or unconditional) models in which the intercepts (mean levels) of the dependent variables were estimated and the random effects (or estimations of variance) of the following two components were also estimated: classroom means (i.e., classroom intercepts) and the individual errors (i.e., residuals). Subsequently, the predictors (covariates) at Level 1 (student) were included one by one while testing their fixed effects. First, the pretest measurement of the outcome variable was included as a covariate to increase the power of the analyses (Lipsey & Hurley, 2009). Next, the variables related to reading (that were also analyzed separately as outcome variables) were included in the model, that is, reading comprehension, knowledge of reading strategies, and reading motivation. Since every outcome variable may also be a predictor of another outcome variable, these variables are included in the regression, along with the possible confounders. The confounders at Level 1 were vocabulary, non-verbal IQ, and gender. The approach (DE versus PI) was added to the model at Level 2 to test the effects of DE and PI. We controlled for SES in the regression of ethnic minority students, and for minority in the regression of low SES students. Each covariate was tested for its contribution to the model fit and its effect on the outcome variable. The calculated deviance statistics (–2 log likelihood) of the different models were compared and tested with a χ^2 difference test to draw conclusions about the improvement of the model. A positive conclusion led to the inclusion of the predictor in the model. The final models were constructed on the basis of the parsimony principle. More parsimonious models were created by removing nonsignificant predictors whose removal did not negatively affect the model fit.

Results

Preliminary analyses

This section begins with descriptions of the means and standard deviations of all variables for the categories minority and low SES[2] by educational approach (DE or PI) and measurement occasion (Table 4).

An analysis of variance revealed that responses of teachers in the DE and the PI approach on the teacher questionnaire differed significantly in three aspects: the use of a program that was based on a textbook, $F(1,22) = 10.80$; $p < 0.05$ (DE: $M = 3.37$,

Table 4. Means and standard deviations of the variables for ethnic minority students (minority) and students with a low parental education level (low SES) by group and measurement occasion.

	DE group						PI group					
	pretest			posttest			pretest			posttest		
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
ethnicity												
reading comprehension[a]	71	6.28	3.10	72	7.87	3.40	63	6.29	2.61	68	8.37	3.32
knowledge of reading strategies[b]	71	35.23	3.93	72	37.86	3.45	65	34.03	4.03	69	36.14	3.60
reading motivation[c]	56	13.95	1.56	58	14.09	1.57	54	13.75	1.36	65	14.08	1.10
vocabulary[d]	68	15.00	4.59	73	14.42	4.91	66	17.08	4.62	67	16.75	5.06
non-verbal IQ[e]	69	34.77	9.49				68	37.51	7.06			
SES												
reading comprehension[a]	34	5.76	2.65	30	6.93	3.51	37	5.32	2.64	41	7.15	3.14
knowledge of reading strategies[b]	34	34.88	3.56	30	36.60	4.04	38	32.66	3.78	40	35.92	3.62
reading motivation[c]	22	13.84	1.48	28	13.83	1.17	29	13.67	1.43	37	14.09	0.92
vocabulary[d]	33	14.67	3.67	34	13.62	4.57	39	15.21	5.12	39	15.10	5.12
non-verbal IQ[e]	32	33.84	8.00				38	35.89	6.71			

[a]Total score: range 0 to 17; [b]total score: range 0 to 44; [c]mean sum: range 0 to 19; [d]total score: range 0 to 30; [e]total score: range 0 to 60.

SD = 0.74; PI: *M* = 2.33, *SD* = 0.75), the provision of choice of texts, $F(1,22) = 19.08$; $p < 0.05$ (DE: *M* = 3.67, *SD* = 0.74; PI: *M* = 3.42, *SD* = 0.54), and the integration of reading instruction with content, $F(1,22) = 12.10$; $p < 0.05$ (DE: *M* = 4.00, *SD* = 0.64; PI: *M* = 3.00, *SD* = 0.75). These results revealed that DE teachers were indeed teaching according to the DE approach and PI teachers according to the PI approach. No significant differences were found in teachers' answers about three other aspects. These were providing interesting texts, $F(1,22) = 0.69$, $p > 0.05$ (DE: *M* = 3.67, *SD* = 0.75; PI: *M* = 3.43, *SD* = 0.54), organizing collaboration, $F(1,22) = 0.82$, $p > 0.05$ (DE: *M* = 4.13, *SD* = 0.83; PI: *M* = 4.33, *SD* = 0.71), and fostering successful reading experiences by providing appropriate texts and positive feedback (self-efficacy), $F(1,22) = 0.36$, $p > 0.05$ (DE: *M* = 3.56, *SD* = 0.73; PI; *M* = 3.26, *SD* = 0.85). The contrasts between these approaches were considered sufficient for further analyses, also because these outcomes were confirmed by informal observation of the classrooms and informal conversation with the teachers (see Table 5).

Next, the dependencies of the data were tested. The intra-class correlations were used as an indication of dependency. Table 6 presents the results of the intercept-only models of the outcome variables; that is, reading comprehension, knowledge of reading strategies, and reading motivation. The deviance of the intercept-only models may be compared to the deviance of the final models.

The final model for reading motivation was based on fixed effects at the student level. Although for knowledge of reading strategies the intra-class correlation ICC (8%) indicated

Table 5. Means and standard deviations of the variables in the teacher questionnaire per group.

	DE group (*n* = 16)		PI group (*n* = 15)	
	M	*SD*	*M*	*SD*
non-programmatic character	3.37	(.74)	2.33	(.75)
interesting texts	3.67	(.74)	3.42	(.54)
choice of texts	3.32	(.38)	2.64	(.34)
collaboration	3.56	(.73)	3.26	(.85)
appropriate texts and positive feedback	4.12	(.83)	4.33	(.70)
integration of reading instruction	4.00	(.64)	3.00	(.75)

Table 6. Intercept-only models of reading comprehension, knowledge of reading strategies, and reading motivation of ethnic minority students (minority) and students with low parental education (low SES) of the entire group (DE and PI) (N = 170).

	comprehension	strategies	motivation
	estimate (*SE*)	estimate (*SE*)	estimate (*SE*)
minority (n = 143)			
fixed effect parameters			
intercept	–.36** (.13)	–.12 (.10)	.11 (.07)
random effect parameters			
residuals (students)	.76** (.10)	.71** (.09)	.75** (.09)
intercept (subject = classroom)	.18 (.10)	.06 (.05)	–
intraclass correlation (icc)	.19	.08	–
deviance (–2 log likelihood)	352	342	350
low SES (n = 74)			
fixed effect parameters			
intercept	–.65** (.17)	–.34* (.15)	–.01 (.13)
random effect parameters			
residuals (students)	.68** (.13)	.73** (.14)	.54** (.10)
intercept (subject = classroom)	.22 (.14)	.14 (.13)	.10 (.09)
intraclass correlation (icc)	.24	.16	.16
deviance (–2 log likelihood)	177	177	151

Notes: A dash means that classroom variance could not be reliably computed by SPSS. Minority and low SES categories partially overlapped: 47 students were in both categories.

that the variance in the data was mainly attributable to the child level, the effects of the predictors could, in theory, still vary randomly across classrooms. Therefore, fixed effects predictors were also allowed to vary randomly across units at the classroom level.

Multilevel analyses: effects of educational approach for ethnic minority students

Table 7 presents the final multilevel models for ethnic minority students and reveals the effects of the approach (DE versus PI) on reading comprehension, knowledge of reading strategies, and reading motivation.

Effects on reading comprehension for ethnic minority students

Table 7 shows that the educational approach (DE or PI) had no effect on comprehension outcomes (this is represented by a blank for the approach). In other words, no differences in reading comprehension were found between DE and PI for ethnic minority students.

Of the predictors, vocabulary (b = 0.20, SE = 0.08, p < 0.01, d = 0.60) and non-verbal IQ (b = 0.18, SE = 0.06, p < 0.01, d = 0.54) had a positive effect on reading comprehension with a medium effect size. SES improved the model fit and was therefore retained in the model.

Effects on knowledge of reading strategies for ethnic minority students

As illustrated in Table 7, the educational approach (DE or PI) had an effect on the knowledge of reading strategies (b = 0.40, SE = 0.19, p < 0.05, d = 0.56). In other words, ethnic minority students in DE had better knowledge of reading strategies than their counterparts in PI. Vocabulary was the only predictor with a positive effect on knowledge of reading strategies

Table 7. Final multilevel models of reading comprehension, reading motivation, and knowledge of reading strategies of ethnic minority students (DE approach versus PI approach) (n = 143).

	comprehension			strategies			motivation		
parameters	*b*	*SE*	*d*	*b*	*SE*	*d*	*b*	*SE*	*d*
intercept	–.13	(.10)		–.09	(.14)		.11	(.08)	
Level 1 fixed effects									
pretest	.27**	(.08)	.81	.37**	(.08)	1.04	.47**	(.06)	1.34
comprehension	X								
strategies				X					
motivation							X		
vocabulary	.20**	(.08)	.60	.19*	(.08)	.54	.13	(.07)	.37
non-verbal IQ	.18**	(.06)	.54						
gender (0 = girl)									
SES (0 = low)	–.13	(.14)	.19	–.18	(.15)	.25	.11	(.14)	.16
Level 2 fixed effects									
Approach (0 = DE)				.40*	(.19)	.56			
random effects									
residual	.76**	(.10)		.51**		(.07)	.49**	(.07)	
class/school	.18	(.10)		.05		(.04)			
icc	.19			.09					
–2*log likelihood	352			277			272		
χ^2 difference test	χ^2 (4) = 98**			χ^2 (3) = 61**			χ^2(3) = 78**		

Notes: Blanks: no improvement of the model fit, and no significant effect, the variable was removed from the model. Level 1 is the student level, and Level 2 is the classroom level. SES represents a low level of parental education. Gender is coded 0 for girls and 1 for boys; SES is coded 0 for low SES and 1 for high SES; the approach is coded 0 for DE and 1 for PI.
**p < .01. *p < .05.

(b = 0.19, SE = 0.08, p < 0.05, d = 0.54). SES had a small effect size (b = –0.18, SE = 0.15, p > 0.05, d = 0.25) and improved the model fit; it was therefore retained in the model.

Further exploration of the DE group and the PI group separately revealed that PI accounted for the positive effect of vocabulary (b = 0.35, SE = 0.13, p < 0.01, d = 0.97). This means that for ethnic minority students in PI, a rich vocabulary benefits their knowledge of reading strategies. In DE, a negative effect was found for SES (b = –0.47, SE = 0.18, p < 0.01, d = 0.75), which means that ethnic minority students with a low parental education level have less knowledge of reading strategies than students with more educated parents. Furthermore, a medium effect size was found in DE for reading comprehension (b = 0.21, SE = 0.09, p > 0.05, d = 0.66), which also improved the model fit. This indicates that in DE, ethnic minority students with good reading comprehension tend to have a good knowledge of reading strategies, but not so in PI.

Effects on reading motivation for ethnic minority students

As seen in Table 7, which contains a blank for the approach, the educational approach (DE or PI) had no effect on reading motivation. This means that no differences were found between DE and PI for ethnic minority students on reading motivation.

None of the predictors had an effect on the outcomes of reading motivation at the end of Grade 4. SES improved the model fit and was therefore retained in the model.

Multilevel analyses: effects of educational approach for low SES students

Table 8 presents the final multilevel models for low SES students and reveals the effects of the approach (DE versus PI) on reading comprehension, knowledge of reading strategies, and reading motivation for this category of students.

Table 8. Final multilevel models of reading comprehension, reading motivation, and knowledge of reading strategies of students with a low parental education level (DE approach versus PI approach) (n = 74).

	comprehension			strategies			motivation		
parameters	*b*	*SE*	*d*	*b*	*SE*	*d*	*b*	*SE*	*d*
intercept	−.25*	(.12)		−.16	(.15)		−.03	(.14)	
Level 1 fixed effects									
pretest	.61**	(.10)	1.90	.52**	(.11)	1.44	.29**	(.09)	.84
comprehension	X								
strategies				X					
motivation							X		
vocabulary									
non-verbal IQ	.22**	(.10)	.69				.10	(.09)	.30
gender (0 = girl)									
minority (0 = not Dutch)									
Level 2 fixed effects									
approach (0 = DE)									
random effects									
residual	.41**	(.08)		.52**		(.10)	.44**	(.09)	
class/school	.06	(.05)		.16		(.12)	.12	(.10)	
icc	.13			.24			.26		
−2*log likelihood	136			158			147		
χ^2 difference test	χ^2 (2) = 41**			χ^2 (1) = 19**			χ^2(2) = 14**		

Notes: Blanks: no improvement of the model fit, and no significant effect, the variable was removed from the model. Level 1 is the student level, and Level 2 is the classroom level. Ethnicity represents parental country of origin and home language not exclusively Dutch. Gender is coded 0 for girls and 1 for boys; Ethnicity is coded 0 for parents and home language not exclusively Dutch and 1 for both parents and home language Dutch; the approach is coded 0 for DE and 1 for PI.
**p < .01. *p < .05.

Effects on reading comprehension for low SES students

The educational approach (DE or PI) had no effect on comprehension outcomes as seen in Table 8, which contains a blank for the approach. In other words, no differences were found between DE and PI for students with a low parental education level on reading comprehension.

Of the predictors, non-verbal IQ (b = 0.22, SE = 0.10, p < 0.01, d = 0.69) had a positive effect on reading comprehension with a medium effect size. This means that intelligent students with a low parental education level have better reading comprehension than their less intelligent counterparts.

Effects on knowledge of reading strategies for low SES students

The educational approach (DE or PI) had no effect on knowledge of reading strategies, as seen in Table 8, which contains a blank for the approach. This means that no differences were found between DE and PI for students with a low parental education level on the knowledge of reading strategies. None of the control variables had an effect on knowledge of reading strategies or improved the model fit.

Effects on reading motivation for low SES students

The educational approach (DE or PI) had no effect on low SES students' reading motivation, as seen in Table 8, which contains a blank for the approach. In other

words, no differences were found between DE and PI for students with a low parental education level on reading comprehension.

Of the predictors, non-verbal IQ had a small effect size ($b = 0.10$, $SE = 0.09$, $p > 0.05$, $d = 0.30$), and improved the model fit. This means that intelligent students with a low parental education level are more motivated to read informative texts than their less intelligent counterparts.

Conclusion and discussion

The aim of the present study was to compare the effects on students with an ethnic minority background or with low-educated parents of two approaches to reading comprehension instruction, that is, the innovative meaning-oriented practice of Developmental Education (DE) and the more traditional practice of Programmatic Instruction (PI). We focused on students with an ethnic minority background and students from low SES families. The effects of the DE and PI approach were compared in terms of students' reading comprehension, knowledge of reading strategies, and reading motivation. It was assumed that DE, with its focus on meaning, adds value to reading instruction, and motivates students to read informative texts.

The research questions focused on the extent to which fourth-grade ethnic minority or low SES students in innovative DE schools differ from similar students in traditional PI schools regarding the outcome variables reading comprehension, knowledge of reading strategies, and motivation for reading informative texts. For ethnic minority students, no differences were found between the approaches regarding reading comprehension and reading motivation, after controlling for vocabulary, non-verbal IQ, SES, and gender. Ethnic minority students in DE, however, were found to have significantly better knowledge of reading strategies than students in PI. For students from low SES families, no differences between DE and PI were found for any of the outcome variables.

In general, we may conclude that the innovative DE approach is as suitable for students from ethnic minority or low SES families as the traditional PI approach regarding reading informative texts. Whereas no differences between the approaches were found for reading comprehension and reading motivation, ethnic minority students in DE performed better on knowledge of reading strategies than their counterparts in PI.

Contrary to what was expected, however, the focus on reading for meaning in DE did not lead to higher motivation among ethnic minority or low SES students to read informative texts. This corresponds with our earlier findings from a mixed sample, containing ethnic minority/majority students with low-educated and high-educated parents ($N = 570$) (Van Rijk, De Mey, et al., 2017). For both the present and the previous samples, we were unable to determine whether DE's orientation on meaning motivated students to read informative texts.

It is sometimes assumed that students with disadvantaged backgrounds would benefit more from traditional approaches in which a fixed curriculum, direct instruction, and rehearsal are core (Hornstra et al., 2015; Overmaat & Ledoux, 2002). The results of the present study suggest that ethnic minority or low SES students benefit equally from an innovative approach with a focus on an active role of students in their own learning process and a teacher who guides rather than transmits knowledge. This is in line with Van Oers and Duijkers (2013). The finding that ethnic minority students in DE had higher

scores on knowledge of reading strategies corresponds with earlier findings. This has been explained by a tendency of these students to compensate their inadequate language skills for the language used in their school by making an extra effort for reading strategies (Snow, 2002). It remains to be explained, however, why this is more the case in DE than in PI. It leads us to think that characteristics of the DE approach may account for the effect. It may be the instruction of reading strategies in DE (modeling more than direct instruction, making reading personally meaningful and functional reading instead of textbook-driven reading) which makes the use and the usefulness of reading strategies clearer to ethnic minority students. It may also be that reading strategies are more meaningful to students when needed for understanding text content that is meaningful to them. It remains unclear why this is not also the case for students from low SES families, including ethnic minority students from low SES families.

Noticeable for students with a low parental education level is the absence of predictors (except non-verbal IQ), in combination with the high percentages for classroom influence. For these students, classroom variance was high (ranging from 13% to 26%). Although the present study does not offer an explanation for this finding, it indicates that, with regard to learning to read informative texts, variables at the classroom level matter for students with a low parental education level. However, in this study we have not been able to identify these variables. These variables may be related to classroom composition or teacher quality. Allington (2002) suggests that good teachers matter much more than particular curriculum materials, pedagogical approaches, or "proven program" (p. 2). The teacher is the first factor in line to influence effectiveness (Hattie, 2009). Other studies have shown that 43% of the variance in student achievement in reading comprehension can be attributed to teacher quality (Snow, 2002).

An important limitation of the present study are the small numbers of students with an ethnic minority background and students with a low parental education level that could be included in the study. Since DE is a relatively recent, innovative concept that appeals mostly to highly educated native Dutch parents in urban contexts, large numbers of ethnic minority or low SES students could not be found in DE. This was especially the case for native Dutch students with a low parental education level. Moreover, almost two thirds of the students with a low parental education level also belonged to the ethnic minority group. Numbers were too small to focus on the category of low SES minority students. Moreover, in our analyses we have calculated the main effects of the predictors. It would have been interesting to also establish interaction effects between the approach (DE or PI) and minority and between the approach and low SES. Again, numbers were too small. However, the findings of the present study provide indications that innovative education is as favorable to students from ethnic minority or low SES families concerning reading informative texts as traditional education is. For more detailed insights, a larger sample would be required. In future research, as the number of DE schools increases, it may become possible to focus more on reading achievements and motivation of these groups of students.

Finally, it is a limitation of the present study that the examinations of the teachers' instructional practices within both approaches were based on self-reports. DE and PI schools may be more heterogeneous in their reading approaches than the measures used indicated. Systematic classroom observations would have provided more insight into actual practices. Future research on teaching to read informative texts to

disadvantaged students could make use of classroom observations and study the perceptions of the teachers and the students of the educational approach.

The present study has raised some more issues for future research. Teachers in the study of Hornstra et al. (2015a) were reluctant to adopt an innovative approach for ethnic minority or low SES students, although no significant relations were found between (teachers' perceptions of) the extent of innovativeness of their reading practices and reading comprehension scores of these groups of students. Future research on teachers' reluctance to adopt innovative approaches may shed some light on teachers' needs in terms of schooling and support.

In this study, ethnic minority students in DE were found to have a better knowledge of reading strategies than their counterparts in PI. However, in DE (not in PI), ethnic minority students with a low parental education level had less knowledge of reading strategies compared to ethnic minority students with more highly educated parents. Our study did not enable us to obtain a more detailed view of this issue. Since this is a group that needs teachers' special attention, further research may investigate the educational needs of this particular group of students.

In the present study, we were unable to confirm the assumption that the DE reading approach adds value in terms of motivating students; DE, with its focus on reading for meaning, was not found to motivate students with a minority background or with low-educated parents to read informative texts more than PI did. Further research is needed to gain more insight into the added value of DE in terms of the other, further-reaching DE goals of identity development, agency and citizenship.

Notes

1. In SPSS, two estimation methods are available: restricted maximum likelihood (RML) and ML. The latter estimation method is preferable when comparing the fit indices (–2 log likelihood) of two models that differ only in the numbers of fixed-effect parameters, as was the case in the present study.
2. These categories overlap; 47 students were from both ethnic minority and low SES families.

Disclosure statement

No potential conflict of interest was reported by the authors.

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References

Allington, R. L. (2002). What I've learned about effective reading instruction: From a decade of studying exemplary primary classroom teachers. *Phi Delta Kappan*, *83*(10), 740–747. doi:10.1177/003172170208301007

Brand-Gruwel, F. L. J. M. (1995). *Onderwijs in tekstbegrip: Een onderzoek naar het effect van strategisch lees- en luisteronderwijs bij zwakke lezers* [Teaching reading comprehension: The effects of teaching reading and listening strategies to poor readers] (Doctoral dissertation). Ubbergen: Tandem Felix.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Davis, D. S. (2010). *A meta-analysis of comprehension strategy instruction for upper elementary and middle school students* (Unpublished doctoral dissertation). Graduate School of Vanderbilt University, Nashville, TN.

De Kock, A., Sleegers, P., & Voeten, M. J. M. (2004). New learning and the classification of learning environments in secondary education. *Review of Educational Research*, *74*(2), 141–170. doi:10.3102/00346543074002141

De Milliano, I. I. C. M. (2013). *Literacy development of low-achieving adolescents: The role of engagement in academic reading and writing* (Doctoral dissertation). Retrieved from https://pure.uva.nl/ws/files/1797404/122873_thesis.pdf

Driessen, G. (2013). *De bestrijding van onderwijsachterstanden. Een review van opbrengsten en effectieve aanpakken* [Combating educational disadvantages. A review of the outcomes and effective approaches]. Nijmegen: ITS, Radboud Universiteit Nijmegen.

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). London: Sage.

Förrer, M., & Van de Mortel, K. (2010). *Lezen… denken… begrijpen! Handboek begrijpend lezen in het basisonderwijs* [Reading… thinking… understanding! Manual for reading comprehension in primary education]. Amersfoort: CPS.

Gijsberts, M. (2003). Minderheden in het basisonderwijs: Onderwijs, arbeid en sociaal-culturele integratie [Minorities in primary education: Education, employment and sociocultural integration]. In J. Dagevos, M. Gijsberts, & C. Van Praag (Eds.), *Rapportage minderheden 2003* (pp. 63–109). Den Haag: SCP.

Guthrie, J. T. (2010). *Motivations for Reading Questionnaire*. Retrieved from http://www.cori.umd.edu/measures/MRQ.pdf

Guthrie, J. T., McRae, A., & Klauda, S. L. (2007). Contributions of concept-oriented reading instruction to knowledge about interventions for motivations in reading. *Educational Psychologist*, *42*(4), 237–250. doi:10.1080/00461520701621087

Guthrie, J. T., & Wigfield, A. (2000). Engagement and motivation in reading. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 403–424). Mahwah, NJ: Lawrence Erlbaum Associates.

Guthrie, J. T., Wigfield, A., Barbosa, P., Perencevich, K. C., Taboada, A., Davis, M. H., … Tonks, S. (2004). Increasing reading comprehension and engagement through concept-oriented reading instruction. *Journal of Educational Psychology*, *96*(3), 403–423. doi:10.1037/0022-0663.96.3.403

Guthrie, J. T., Wigfield, A., & You, W. (2012). Instructional contexts for engagement and achievement in reading. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 601–634). New York, NY: Springer.

Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. New York, NY: Routledge.

Heemskerk, I., Brink, A., Volman, M., & Ten Dam, G. (2005). Inclusiveness and ICT in education: A focus on gender, ethnicity and social class. *Journal of Computer Assisted Learning*, *21*(1), 1–16. doi:10.1111/j.1365-2729.2005.00106.x

Hermans, P. (1995). Moroccan immigrants and school success. *International Journal of Educational Research*, *23*(1), 33–43. doi:10.1016/0883-0355(95)93533-2

Hornstra, L., Mansfield, C., Van der Veen, I., Peetsma, T., & Volman, M. (2015). Motivational teacher strategies: The role of beliefs and contextual factors. *Learning Environments Research*, *18*(3), 363–392. doi:10.1007/s10984-015-9189-y

Hornstra, L., Van der Veen, I., Peetsma, T., & Volman, M. (2015a). Does classroom composition make a difference: Effects on developments in motivation, sense of classroom belonging, and achievement in upper primary school. *School Effectiveness and School Improvement*, *26*(2), 125–152. doi:10.1080/09243453.2014.887024

Hornstra, L., Van der Veen, I., Peetsma, T., & Volman, M. (2015b). Innovative learning and developments in motivation and achievement in upper primary school. *Educational Psychology*, *35*(5), 598–633. doi:10.1080/01443410.2014.922164

Hox, J. J. (1995). *Applied multilevel analysis*. Amsterdam: TT-Publikaties.

Huber, G. L. (2003). Processes of decision-making in small learning groups. *Learning and Instruction*, *13*(3), 255–269. doi:10.1016/S0959-4752(01)00039-1

Lipsey, M. W., & Hurley, S. M. (2009). Design sensitivity: Statistical power for applied experimental research. In L. Bickman & D. J. Rog (Eds.), *The SAGE handbook of applied social research methods* (2nd ed., pp. 44–76). Thousand Oaks, CA: SAGE.

Moll, L. C., Amanti, C., Neff, D., & Gonzalez, N. (1992). Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. *Theory Into Practice*, *31*(2), 132–141. doi:10.1080/00405849209543534

Mulder, L., Fettelaar, D., Schouwenaars, I., Ledoux, G., Dikkers, L., & Kuiper, E. (2014). *De achterstand van autochtone doelgroepleerlingen* [The disadvantage of indigenous target group students]. Nijmegen: ITS, Radboud Universiteit Nijmegen.

Mullis, I. V. S., Martin, M. O., Kennedy, A. M., & Foy, P. (2007). *PIRLS 2006 international report: IEA's Progress in International Reading Literacy Study in primary schools in 40 countries*. Chestnut Hill, MA: TIMSS & PIRLS International Study Center, Lynch School of Education, Boston College.

National Institute of Child Health and Human Development. (2000). *Report of the National Reading Panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction*. Retrieved from https://www.nichd.nih.gov/publications/pubs/nrp/Pages/smallbook.aspx

Nusche, D. (2009). *What works in migrant education? A review of evidence and policy options*. Paris: OECD.

Organisation for Economic Co-operation and Development. (2012). *Equity and quality in education: Supporting disadvantaged students and schools*. Paris: Author. doi:10.1787/9789264130852-en

Overmaat, M., & Ledoux, G. (2002). De kleur van de school: Een zoektocht naar succesfactoren op zwarte basisscholen [The color of the school: A search for success factors at "black" primary schools]. *Pedagogiek*, *21*(4), 359–371.

Pacheco, M., & Gutiérrez, K. (2009). Cultural-historical approaches to literacy teaching and learning. In C. Compton-Lilly (Ed.), *Breaking the silence: Recognizing the social and cultural resources*

students bring to the classroom (pp. 60–80). Newark, DE: International Reading Association. Retrieved from http://dm.education.wisc.edu/mapacheco/intellcont/PachecoGutierrezCHT_2008-1.pdf

Pels, T., & Nijsten, C. (2006). Eenheid en diversiteit in opvoeding [Unity and diversity in education]. In T. Pels & W. Vollebergh (Eds.), *Diversiteit in opvoeding en ontwikkeling: Een overzicht van recent onderzoek in Nederland* (pp. 47–76). Amsterdam: Aksant.

Pels, T., Nijsten, C., Oosterwegel, A., & Vollebergh, W. (2006). Myth and realities of diversity in child rearing: Minority families and indigenous Dutch families compared. In M. Dekoviç, T. Pels, & S. Model (Eds.), *Child rearing in six ethnic families: The multi-cultural Dutch experience* (pp. 213–245). Lewiston, NY: Edwin Mellen Press.

Perie, M., Grigg, W. S., & Donahue, P. L. (2005). *The Nation's Report Card: Reading 2005*. (NCES 2006–451). Washington, DC: U.S. Government Printing Office. Retrieved from http://nces.ed.gov/nationsreportcard/pubs/main2005/2006451.asp

Raven, J., Raven, J. C., & Court, J. H. (2000). *Manual for Raven's progressive matrices and vocabulary scales. Section 3: The standard progressive matrices*. Oxford, UK: Oxford Psychologists Press.

Salinas, M. F., & Garr, J. (2009). Effect of learner-centered education on the academic outcomes of minority groups. *Journal of Instructional Psychology*, *36*(3), 226–237.

Sijtsma, K. (2009). On the use, the misuse, and the very limited usefulness of Cronbach's alpha. *Psychometrika*, *74*(1), 107–120. doi:10.1007/S11336-008-9101-0

Snow, C. (2002). *Reading for understanding: Toward an R&D program in reading comprehension*. Santa Monica, CA: RAND.

Spera, C. (2005). A review of the relationship among parenting practices, parenting styles, and adolescent school achievement. *Educational Psychology Review*, *17*(2), 125–146. doi:10.1007/s10648-005-3950

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics*. Boston, MA: Allyn & Bacon.

Tellegen, S., & Frankhuisen, J. (2002). *Waarom is lezen plezierig?* [Why is reading pleasant?]. Delft: Stichting Lezen/Eburon.

Terhart, E. (2011). Has John Hattie really found the holy grail of research on teaching? An extended review of *Visible Learning*. *Journal of Curriculum Studies*, *43*(3), 425–438. doi:10.1080/00220272.2011.576774

Tesser, P. T. M., & Iedema, J. (2001). *Rapportage minderheden 2001: Deel I Vorderingen op school* [Minority report 2001: Part I Progress at school]. Den Haag: Sociaal en Cultureel Planbureau.

Tymms, P. (2004). Effect sizes in multilevel models. In I. Schagen & K. Elliot (Eds.), *But what does it mean? The use of effect sizes in educational research* (pp. 55–66). Slough: National Foundation for Educational Research.

Van Hout-Wolters, B., Simons, R. J., & Volet, S. (2000). Active learning: Self-directed learning and independent work. In R. J. Simons, J. L. van der Linden, & T. Duffy (Eds.), *New learning* (pp. 21–36). Dordrecht: Kluwer Academic.

Van Oers, B. (2009). Developmental education: Improving participation in cultural practices. In M. Fleer, M. Hedegaard, & J. Tudge (Eds.), *Childhood studies and the impact of globalization: Policies and practices at global and local levels* (pp. 293–317). New York, NY: Routledge.

Van Oers, B., & Duijkers, D. (2013). Teaching in a play-based curriculum: Theory, practice and evidence of developmental education for young children. *Journal of Curriculum Studies*, *45*(4), 511–534. doi:10.1080/00220272.2011.637182

Van Rijk, Y., De Mey, L., De Haan, D., Van Oers, B., & Volman, M. (2017). Reading for meaning: The effects of Developmental Education on motivation and achievement in reading informative texts in primary school. *Research Papers in Education*, *32*(3), 333–352. doi:10.1080/02671522.2016.1225789

Van Rijk, Y., Volman, M., De Haan, D., & Van Oers, B. (2017). Maximising meaning: Creating a learning environment for reading comprehension of informative texts from a Vygotskian perspective. *Learning Environments Research*, *20*(1), 77–98. doi:10.1007/s10984-016-9218-5

Verhoeven, L., & Vermeer, A. (1995). *Handleiding leeswoordenschat* [Guide for reading vocabulary]. Arnhem: Cito.

Wardekker, W. (2012). Responsible teaching. In B. Van Oers (Ed.), *Developmental Education for young children: Concept, practice and implementation* (pp. 27–39). Dordrecht: Springer.

Wells, G. (2000). Dialogic inquiry in education: Building on the legacy of Vygotsky. In C. D. Lee & P. Smagorinsky (Eds.), *Vygotskian perspectives on literacy research: Constructing meaning through collaborative inquiry* (pp. 51–85). Cambridge, UK: Cambridge University Press.

Wells, G., & Claxton, G. (Eds.). (2002). *Learning for life in the 21st century: Sociocultural perspectives on the future of education*. Oxford. UK: Blackwell.

West, B. T., Welch, K. B., & Galecki, A. T. (2007). *Linear mixed models: A practical guide using statistical software*. New York, NY: Chapman & Hall/CRC.

Wigfield, A., & Guthrie, J. T. (1997). Relations of children's motivation for reading to the amount and breadth of their reading. *Journal of Educational Psychology*, *89*(3), 420–432. doi:10.1037/0022-0663.89.3.420